Class 153
Class 153 B
Class 153 A
Class 153 AB

Instructions
FOR MECHANICIANS

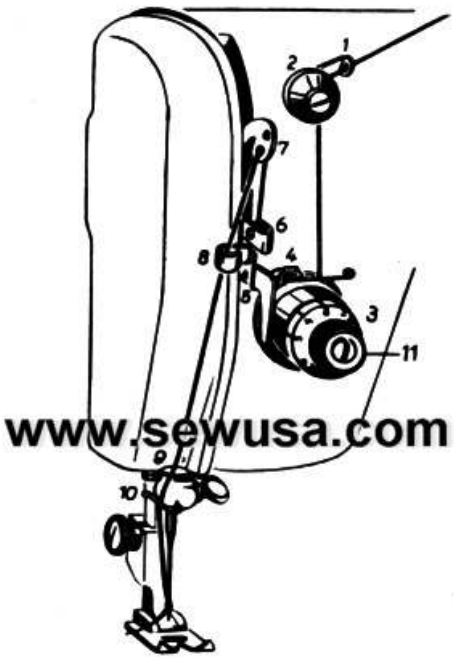
MJ 4153 A - te - 7.55 KAW

I N D E X

The Adler Class 153 is a universal zigzag and straight stitch sewing machine for sewing, embroidery, and darning. It is used in the household for universal household purposes. The Adler Class 153 A, in addition to the above functions, embroiders and blind-stitches automatically. The maximum speed of the 153 exceeds 1200 stitches per minute.

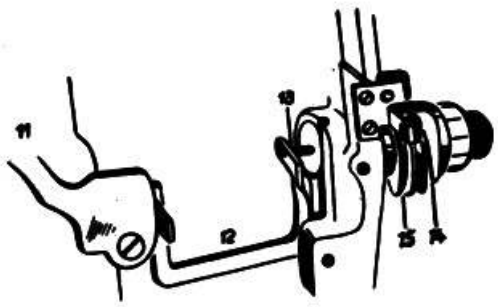
The guidance of the upper thread has the purpose to convey the upper thread to the seam evenly and with the adequate tension for every type of sewing work.

The upper thread guide 2 works as pre-tension which feeds the upper thread evenly to the tension discs. The thread is guided through the eye 1 to avoid the jumping of thread out of pre-tension 2.



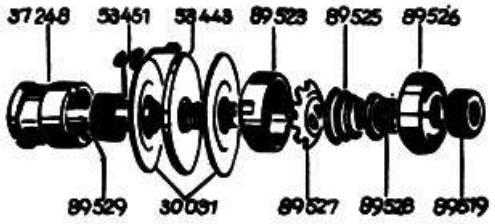
The upper thread tension 3 adjusts the tension necessary for a perfect seam. The upper tension is easily adjusted to the sewing requirements by a change of the spring pressure.

The figures on the tension dial indicate the degree of tension. At dial position zero there should be no tension at all and the tension increases according to the numbers shown on the dial.

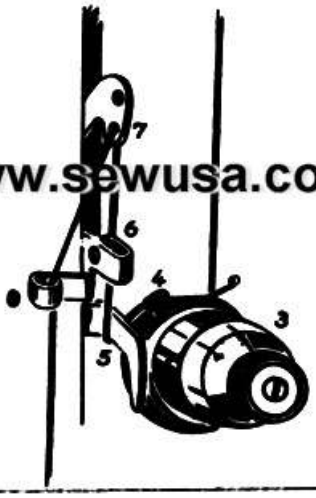


In order to facilitate the threading and pulling of the upper thread the tension is released by lifting the pressure bar lift lever. Thereby the tension release lever 12 presses against the tension release pinion 13, and tension release pinion again presses against tension bush 14. Thereby the pressure against the tension disc 15 is eliminated.

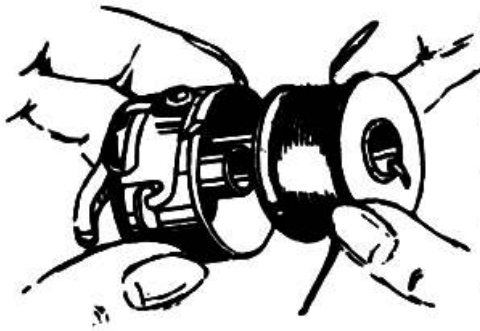
The upper thread, after leaving the tension, is threaded through the tension check spring 4. The check spring secures the thread movement in relation to the take-up lever. The adjustment of the check spring is described on Page 15.



The thread then goes further below the thread guide hook 5, through the right thread guide 6, through the eye of the take-up lever 7, through the lift thread guide 8, through the thread guide 9 at the head plate and through the thread eye 10 at the needle clamp. This thread eye shall be set as closely as possible to the needle clamp so that the needle cannot be moved sideways by the draft of the thread in oblique direction.

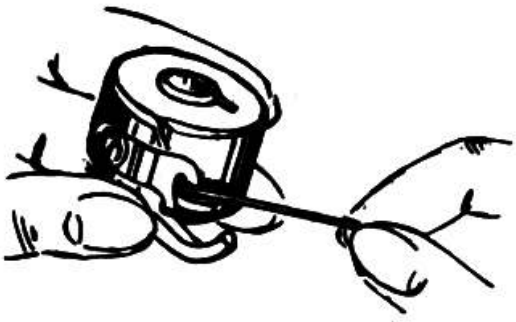


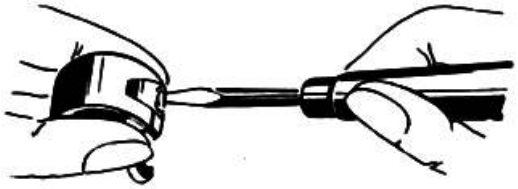
All holes of the thread guidance must be well polished and may not show any warts, notches or rough spots.



As shown by the sketches at the left, the under-thread is threaded through the slot in the bobbin case under the tension spring. The direction in which the bobbin thread leaves the bobbin casing is indicated by the sketch.

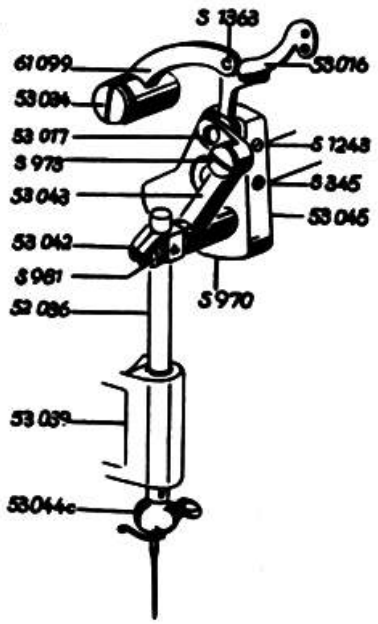
In general, it is not recommended to change the tension of the bobbin thread; only if threads of extreme thickness or thinness are used such a change of the bobbin thread tension is necessary. By turning the set screw for the bobbin thread tension spring slightly to the right the under-thread tension is increased, by turning the screw slightly to the left the tension is descreased.





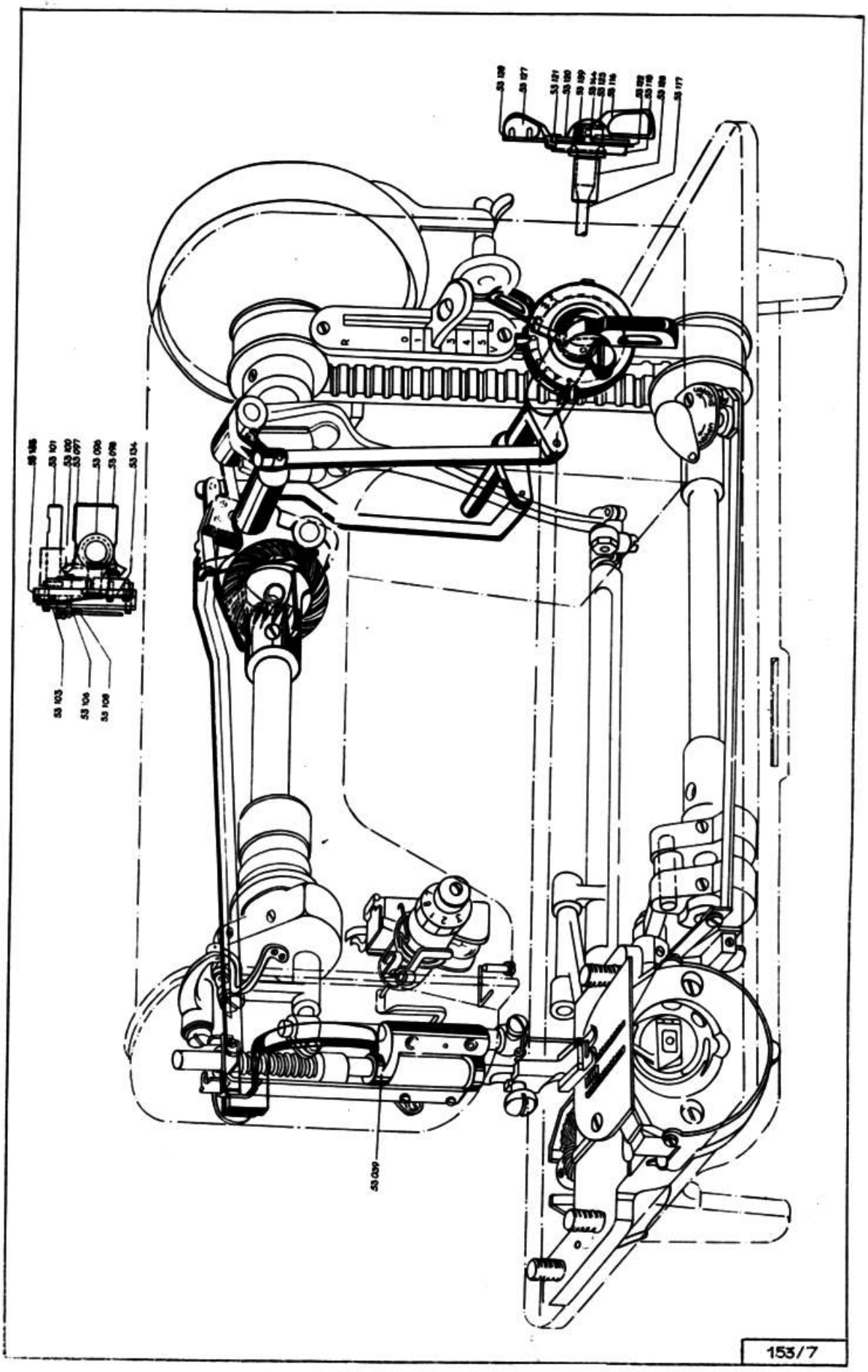
The mechanism for the movement of the needle bar is designed as follows:

The Main Shaft Needle Bar Crank 53045 which sits on the main shaft drives by way of needle bar link 53043, the link piece 53042, and the needle bar 53036, achieving the upward and downward movement of the needle bar.



The needle, 15 x 1 or 130R, is set into the needle bar. The stop in the needle bar defines the exact position of the needle. The needle is then tightened by the needle clamp 89544c. It is important to use a high quality needle for automatic zig zag and for automatic embroidery work and monograming, we recommend special needle 130R.

Very often defects in sewing and embroidering are caused by the use of poor needles. Bent needles skip stitches or may even break. Thread grooves or needle eyes which are not well polished cause breakage of thread. Also, needles with uneven thread grooves or with imperfect thread eyes cause the skipping of stitches.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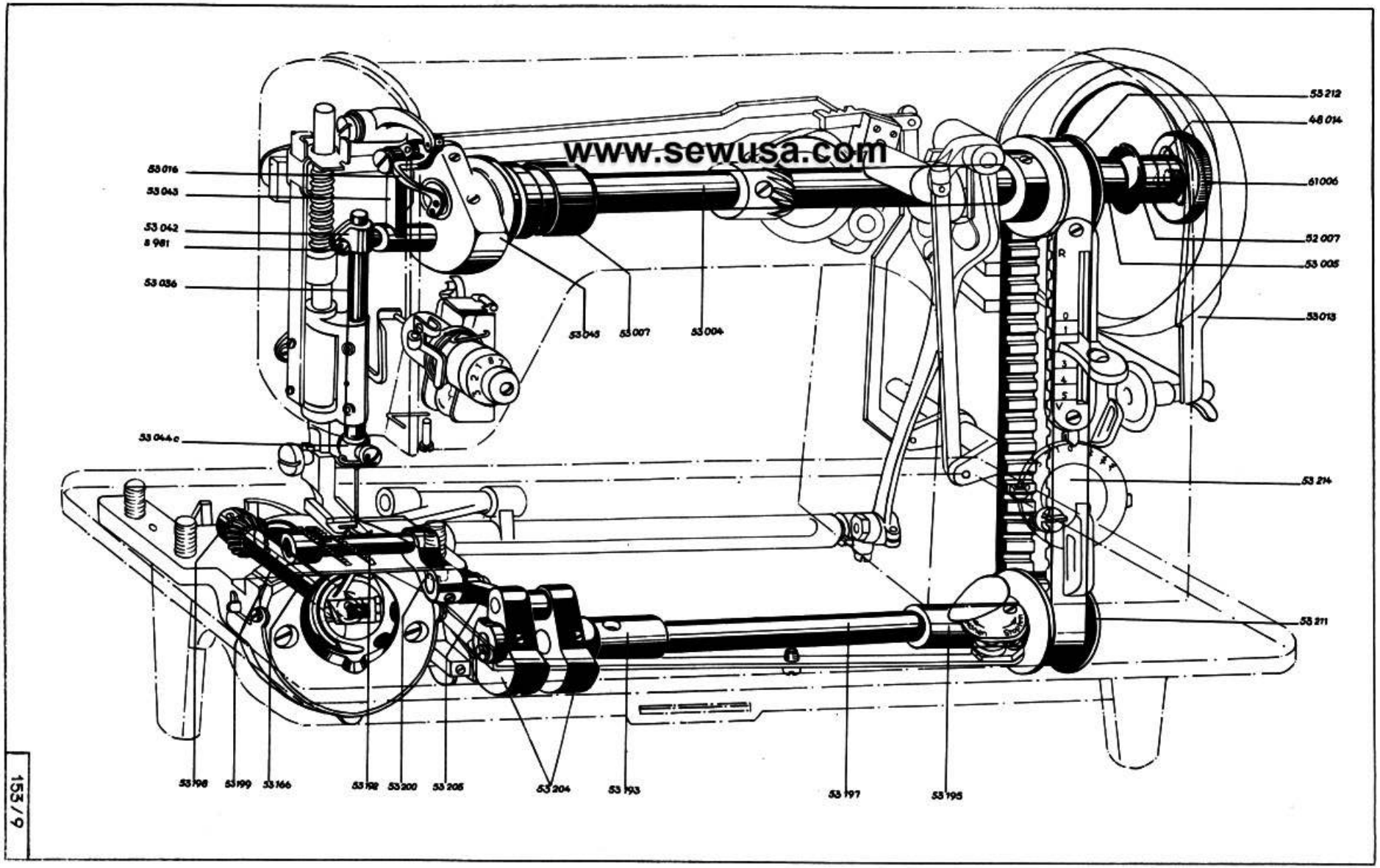
Breadth of Zig Zag Over-stitch (bite)

The sideways movement of the needle bar is guided by the zig zag cam 53097. This Excenter cam is moved by the main shaft through conical gear 53096. The Excenter cam transmits the Excenter movement by the stitch breadth fork 53100 over the slotted link 53102 and the connecting rod 53108 on the needle bar rocker arm 53039. Contrary to most other zig zag and automatic machines, the needle bar of Adler Class 153 is not a swinging needle bar, but the needle bar has a perfect vertical movement and stitches into the material at a right angle at all times due to the use of this rocker arm.

The breadth of zig zag over-stitch (bite) is adjusted by the zig zag lever 53116, which changes the position of the sliding block in the slotted link. At the lowest point of the sliding bar, which means exactly in the dead center of the movement of the slotted link, the sliding block must be at an absolute stand-still and the machine must make a perfect straight stitch without any indication of a zig zag stitch. When zig zagging, this movement must be so timed that there is no lateral movement while the needle is inside the fabric, and while the feed dog is under the stitch plate. The feed dog must be below the stitch plate from the moment the needle has entered the fabric until the time the needle has left the fabric. Even at the widest bite of the needle and when using the heaviest material the needle must enter the fabric at a right angle.

The stitch position lever 53127 adjusts the position of the needle bar to center, right or left. This needle position is not only important for repetitive embroidery work and automatic embroidery work, but also for such work as is done close to the edge of dictation. For instance, when over-edging seams of fine material, the right needle position secures a good zig zag overedging stitch, while the feed bar can be fully used and both sides of the feed dog feed the material.



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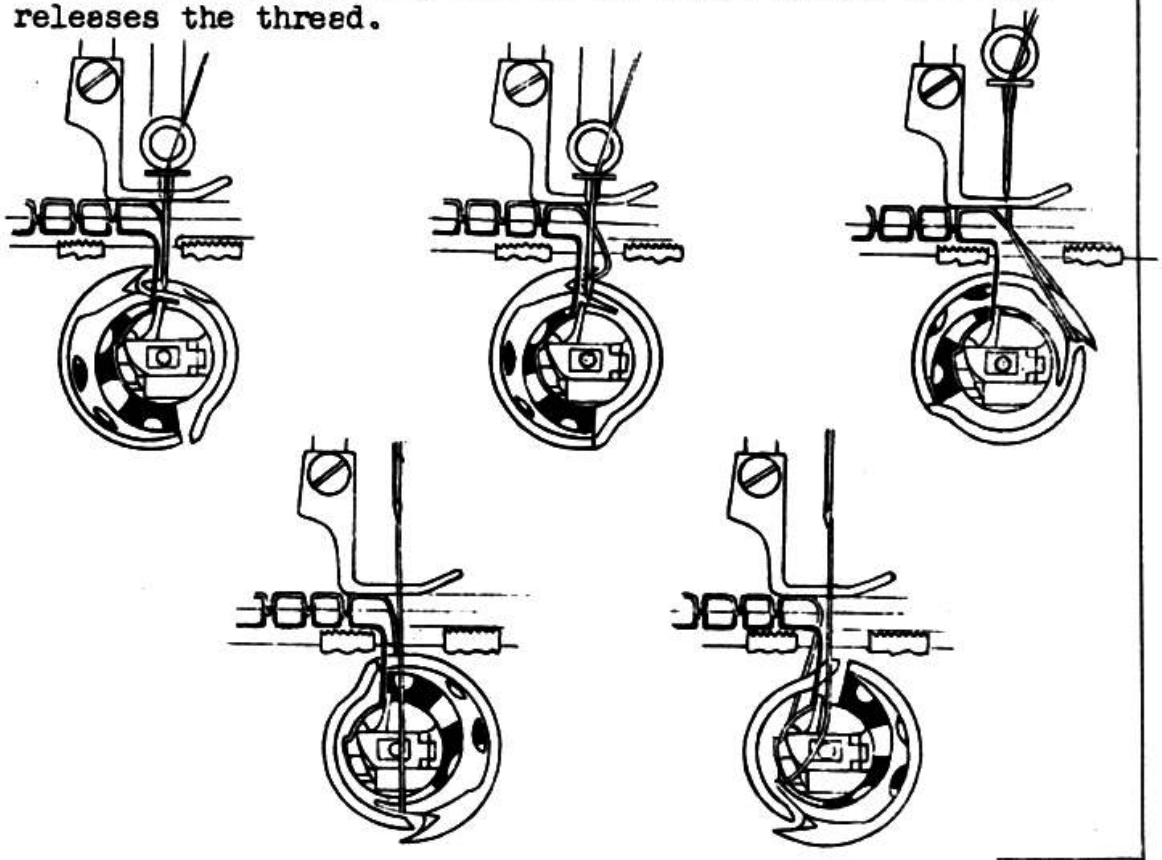
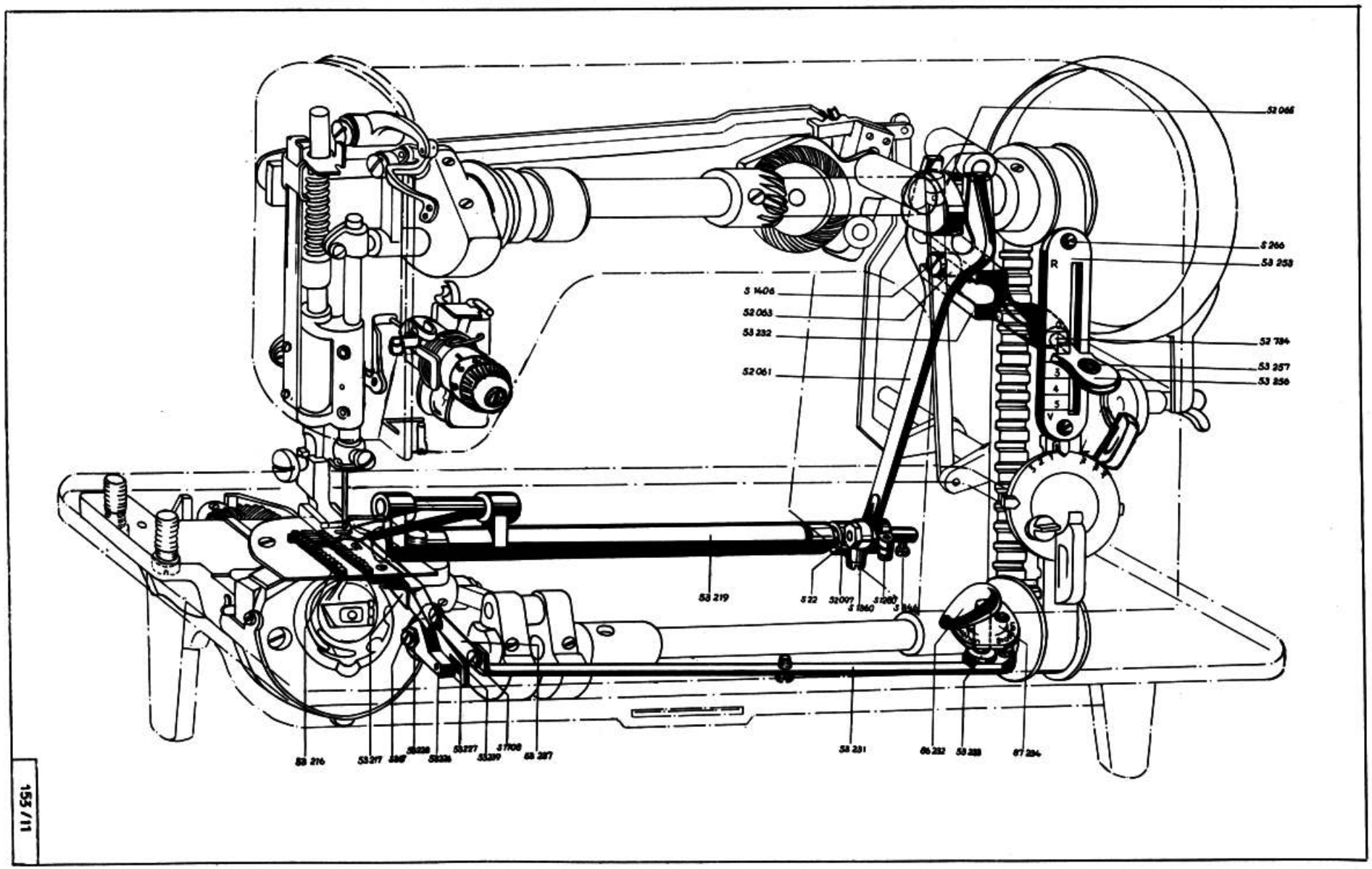
Hook.

The drive of the hook is transmitted from the arm shaft 53004 by means of a teeth-shaped plastic wire core belt 53214 (driving strap) to the shuttle driver shaft 53197. From here the movement is again transmitted by a pair of cranks 53204 (shuttle driver crank) with the shuttle driver crank connecting bar 53205 to the hook driver crank shaft 53192 with the hook driver crank 53200. By means of a teeth-segment 53199 receiving its movement through the hook driver shaft-scratcher 53198 the now oscillating movement is transmitted to the C B hook by means of the hookdriver 53166.

In order to eliminate any noise as far as technically possible the hook driver 53166 is fitted on its connecting points with springs. Furthermore, another important factor for the elimination of noise should be carefully observed, viz. the space between the hook and the connecting points should not be wider than the thickness of the strongest sewing thread used (maximum thickness of thread No. 30).

The hook takes the thread loop up. When the loop is formed by the needle at the start of the upward stroke of the needle, it extends the loop, guides the upper thread around the bobbin case and thereby around the under thread and then releases the thread.

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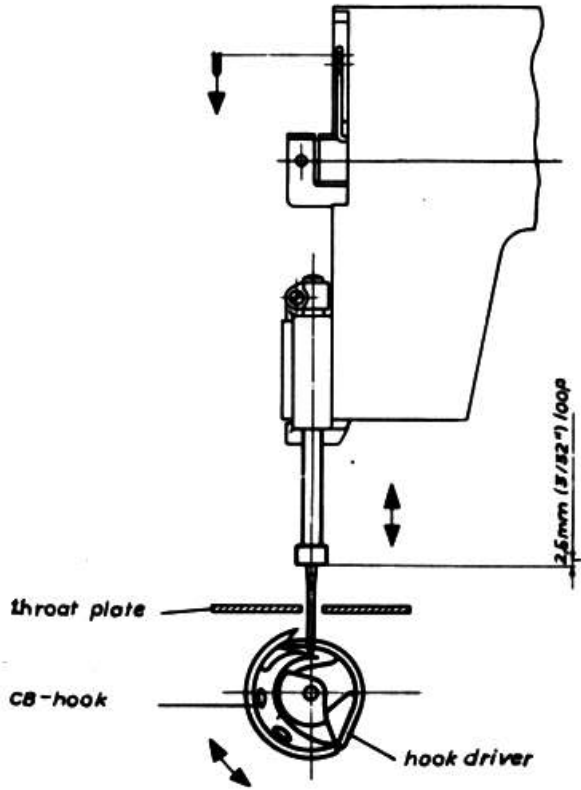
The feed of the material is activated by the stitch regulator excenter 52065 which is held by stitch regulator fork 52061. The movement is transmitted via the stitch regulator fork and feed rocker shaft crank 52097 to feed rocker shaft 53219. Between the two brackets of feed rocker shaft 53219 the feed dog bar pinion 53218 supports the feed dog bar 53217 which activates the feed dog.

In order to adjust the length and direction of the feed, stitch regulator fork 52061 is connected by roller 52063 with the slotted link 53232. The position of slotted link 53232 is manipulated by stitch regulator handle 53256. The stitch regulator scale 52253 indicates the lenght of the forward stitch at the relative position of handle 53256 to the stitch regulator scale. By tightening the ball nut 53257, the lenght of forward and reverse stitch can be limited.

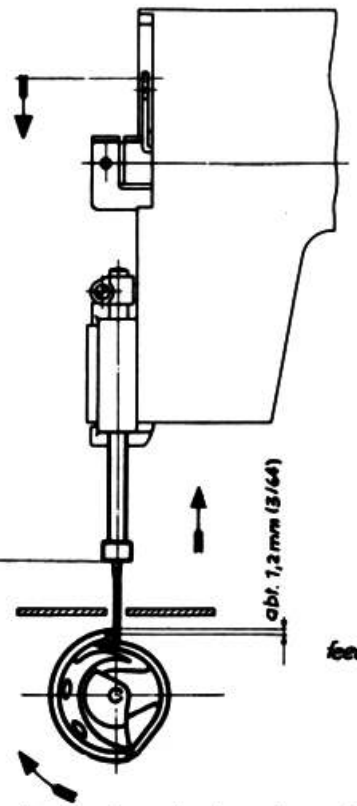
The lift (upward and downward movement) of the feed dog bar 53217 is activated by feed lift excenter 53228 which is attached to the main hook driving shaft. Feed dog bar spring 87219 pulls the feed dog bar 53217 towards the feed lift excenter 53228 and thereby connects excenter and feed dog bar.

To drop feed dog the feed release lever 86232 must be pushed to the right.

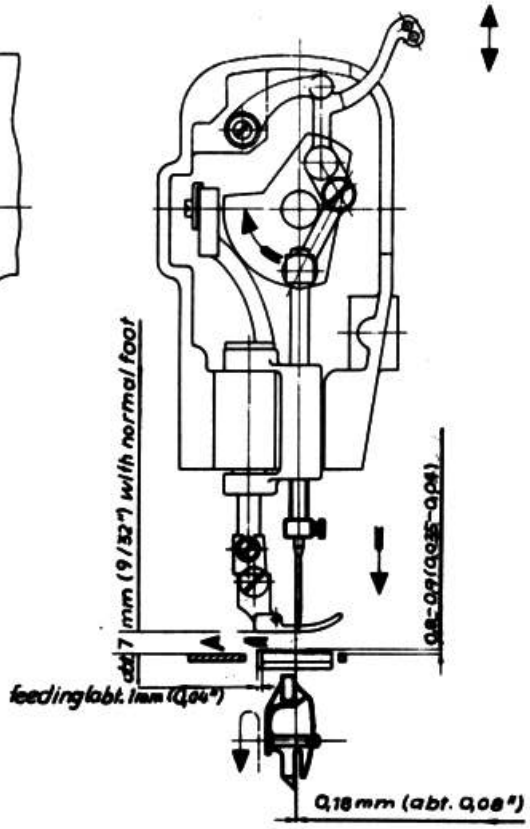
The movement of the feed dog shall form a quadrangle. Square angles shall be approached as much as possible in the change from feed-drop-reverse-lift. This movement is achieved by the triangle excenter.



For adjustment use needle syst. 705 No. 90.
Needle at lowest point.
The feed dog is in lowest position.
The hook starts backward movement.
The take-up lever is downwards moving.



The needle has finished the loop of 2,5 mm (3/32"). The point of the hook is abt. 1,2 mm (3/64") above the needle eye and is starting to enter the thread loop. The take-up lever is still moving downward, the feed dog continues its backward movement.



The take-up lever has reached highest position and the loop is closed. The thread check spring is in tension. The needle has started moving downwards and has covered a distance of abt. 8 mm (5/16"). The feed dog has still abt. 1 mm (0,04") to go forward.

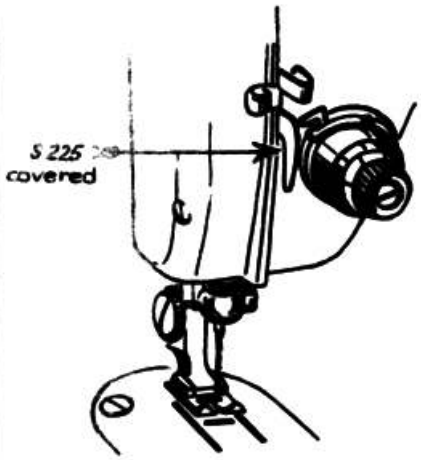
HINTS FOR REPAIRS AND ADJUSTMENTS

Movement uf Upper Thread.

Should the needle break so that it doesn't touch the stitch place, check the eye at the needle clamp. This eye should be as near as possible to the needle clamp, otherwise the oblique pull of the upper thread might bend the needle and cause it to hit the stitch plate or the hook.

Tension of Upper Thread.

The correct assembly of the tension is indispensable. The assembly of the tension is shown on page 3. At zero position of the dial the tension discs should not show any tension.



Tension Check Spring.

It is very important that the tension check spring has just the right amount of tension. For adjustment, loosen and after adjustment tighten the thread tension bolt 53029 which regulates bush 37248.

At the moment the needle starts to enter the fabric, the tension check spring should be loosened.

To adjust timing of the tension check spring loosen screw S 225 and turn entire tension accordingly.

Adjustment of Hook.

Adjust hook with needle position center and zigzag lever at zero. Use a straight needle No.90. Distance between needle size No.90 and point of hook should be .1 mm.(0.04") so that at farthest left and right zigzag position of the needle, the needle nearly touches the point of the hook without making actual contact.

REVERSE MOVEMENT OF HOOK.
LIFT OF LOOP.

At the lowest position of the needle the counterclockwise reverse movement of the hook must be finished and the hook must be at a momentary standstill. To make adjustments, give a slight turn to the upper drive pulley 53212 on main shaft after loosening set screws S 1495. When fastening pulley 53212 again, watch that the wire core belt 53214 does not rub against the side discs of pulley 53212. No other driving parts of the hook need adjustment.
Turn hand wheel forward until the needl bar has risen 2.5 mm (0.1") above its deepest position. At this point the tip of the hook must be exactly behind the needle, and the distance of the upper edge of the needle eye and the tip of the hook must be about 1.2 mm (0.05").

The position of the hook driver can be adjusted after loosening set screws S 1362 in gear segment 53198 after unscrewing the race casing cover 53203. The height of the needle bar is adjustable after loosening set screw S 981 in the needle bar clamp 53042. Note that needle bar may not be turned while adjusting. The thread loop formed by the lifting needle must leave the needle at a right angle and must be picked up by the tip of the hook.

Twin Needles. When using twin needles watch that the distance of both needles from the tip of the hook is identical, but do not adjust needle bar unless several twin needles show the same deviation.

PASSAGE OF THREAD. The space between hook and driver shall be sufficient to allow thread size 00 to pass without difficulty. More ample space would increase the noise; smaller space would impede the movement of the thread.

The space between hook and driver is well adjusted at the factory. Should adjustments ever be necessary then the driver must be bent without damaging the driver spring.

PROTECTION OF THE NEEDLE. The slot of the presser foot should protect the needle against hitting metal surfaces. Should a needle be bent by the upper thread or by use of outside forces, the slot of the presser foot should guide the needle back so that the needle cannot hit the stitch plate or the hook.

The feed should be so adjusted that the forward movement starts only while the needle is outside of the fabric. The backward movement of the lower feed dog must be finished when the needle leaves the fabric and starts to rise. The forward movement of the feed dog should start just after the feed dog has reached its top position.(.8 to .9 mm. = .035" above the needle plate).

When the take-up lever has reached its' highest position, at longest forward stitch, the feed dog shall have nearly completed its forward movement and shall have only 1 mm. (0.04") to go. The feed movement must be finished before the needle enters the fabric.

Adjustment of stitch regulation excenter.

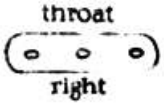
The forward movement is adjusted by the position of the stitch regulation excenter. To change this position loosen set screw S 216 in the excenter and set it into right position by a slight turn of the hand-wheel, then re-tighten set screw S 216. Watch that stitch regulation fork 52061 has only very little sideways play to avoid noise.

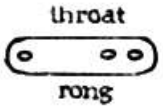
Lift of feed dog in its highest position.

The feed dog should be .8 to .9 mm. (.035") above the stitch plate. To adjust loosen screw S 239 and adjust lift excenter 53228.

Bite of Zigzag Stitch. When adjusting the breadth of overstitch (bite), watch that the needle moves vertically both at the right and left position of the needle bar rocker arm; the needle may not enter the stitch hole in an oblique direction. The swinging movement of the rocker arm starts shortly before the needle bar has reached its highest point, and shall be finished shortly after the needle bar starts its downward movement. To adjust loosen the two screws S 1362 and the conical gear 53096 on the main shaft and turn the excentrical conical gear 53097 until the right adjustment is reached. Then tighten both screws S 1362.

Stitch Position. Check that at the widest zigzag bite the needle clearance at the hole of the zigzag stitch plate is the same at right and left stroke. Test with paper. The needle must stitch in equally from the center without lateral distortion. If there is lateral distortion, loosen the stitch position rest spring 53134 and adjust it to left or right until the needle stitches at equal distance from center at left and right stroke. Then tighten the stitch position rest by screw S 1345.

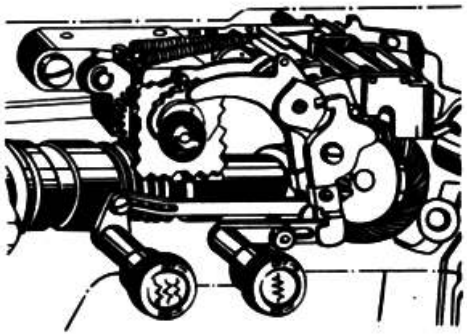




To double check, replace zigzag stitch plate by round hole stitch plate at zero position of the zigzag lever and center position of the stitch position lever. The needle must enter into the center of the round hole. Any necessary adjustment can be effected by loosening connecting bar spring S 778 and adjusting the needle bar rocker 53039 until the needle stitches exactly into the center of the round hole. When making this adjustment watch that the connecting bar stays level in its old position and does not sag while screw S 778 is again tightened.

Adjustment of
The automatic mechanism

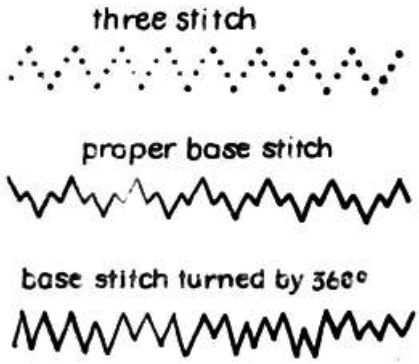
The automatic mechanism guides the stitch position and the breadth of zigzag stitch (bite) by means of exchangeable MP discs.
In "on" position of the zigzag knob the manual zigzag cannot be operated by hand. In "on" position of the stitch position knob the manual position lever cannot be operated by hand.



The basic adjustment of the sewing machine is not changed by the automatic mechanism The automatic stitch position is adjusted by the automatic stitch position spring 53606, which can be moved after loosening the screws S 427. The automatic stitch position spring 53606 can be reached on top of the arm after removal of arm cover 53553.
To insure smooth and noiseless operation, the worm wheel of the automatic assembly should run as closely as possible to the driving worm on the main shaft. To adjust, use screws on rear underside of arm S 1138 (left screw, counter screw) and S 204 (right screw, adjustment screw). Loosen S 1138 and give S 204 a turn to the right. If S 204 does not move, while there is play between worm wheel and worm loosen fixation screw S 1743 (upper left of automatic assembly) for a small fraction of a turn and then try again to turn screw S 204 to the right.
The assembly is basically adjusted as follows:
(1) Use cam 1 manual zigzag lever on zero, forward lever 1-½, automatic zigzag knob off, automatic stitch position knob on. Then stitch on paper. (Simple Jersey Stitch as shown in Direction Book as automatic stitch No.1). At every stitch the needle must enter the paper at the right angle.

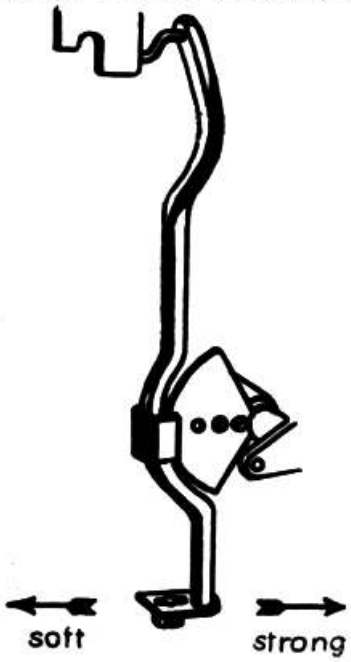
Watch that the stitch position cam lever (finger) rests horizontally on the outer cam surface.

(2) Check of the automatic stitch position same as (1),but manual zigzag lever at (2), forward lever at (2). Test on paper. The stitches must be in the position as indicated in the middle of the sketch at the left. If the stitches are not duplicating this picture then the driving worm on the arm shaft must be given a turn as described below.



To illustrate the changes of the stitch picture the lower sketch at the left shows the position of stitches if the worm has been given one full turn after having been first in perfect position.
While adjusting the worm, it should be pushed always to the left against the set ring on the main shaft.

For perfect adjustment watch the farthest stitch to the left. The stitch position cam lever (finger) must be at the lowest point of the stitch position cam and must have reached the end of the lowest horizontal cam surface just at the moment when the needle leaves the fabric in its extreme left position.
To achieve this, loosen the 2 set screws of the worm on the main shaft. Hold the worm by pushing the screw driver against the screw hole and turn the hand-wheel slowly forward.
Hold the worm towards the left against the set ring on the main shaft. After finishing the adjustment tighten the screws which fasten the worm.



To insure the perfect working of the manual zigzag operation, the zigzag lever brake bar can be adjusted as follows: While the automatic zigzag knob is in "off" position loosen brake screw S 168 under the base plate and adjust the zigzag brake and tighten brake screw. The manual zigzag lever should not move too easily and a certain resistance should be felt so that the manual zigzag lever when not operated, will stay in position while the zigzag automatic knob is "off".

The wire core driving belt

The wire core driving belt should not need replacement for a lifetime according to experience both in its application in the clothing industry and in use of the Adler-matic and other zigzag machines. The ten wire cores prevent stretching and change of shape.

The only cause for damages to the wire core belts could be:

Breaking of wire core before the belts are built in, by force or pressure. (When storing, the belt should not be pressed flat.)

Heating above 212° F.

The belt is not affected by mineral oils nor by most acids.

Replacement for the wire core belt will only be furnished if you inform your supplier regarding the cause and nature of the damage sustained. The wire core belts must be built in so that the sewing machine continues to run easily, but that the belt has no play. If the belt should sit loosely this would impair the timing of the hook. Do not try to stretch belt. The wire cores prevent stretching.

EXCHANGE OF THE DRIVE BELT.

Take off motor belt guard 53013 after loosening screws S 1559. Remove the zigzag stitch breadth connecting bar 53126 after loosening the two bolts S 1333. Put needle bar into lowest position. In order to facilitate the re-assembly, place markers for the adjustment of:

Stitch regulator excenter, main shaft and stitch regulator fork.

Stitch breadth excenter and stitch breadth fork.

Conical gear on main shaft and excentrical zigzag gear.

Loosen set screws of needle bar crank 53045 and remove set screw S 345. Loosen the two set screws S 1495 in set ring 53011. Loosen the two set screws S 1362 and conical gear 53096 on main shaft. Loosen set screw S 1216 and stitch position excenter 52065. Loosen set screws S 1495 in upper drive pulley 53212 Screw out the stop set screw at front plate. Loosen the two set screws S 1333 for the hinge angles, and take off front plate 53002c.

Use a Punch of 12.60 mm.diameter = 0.004" less than ½" diameter.

Place Punch on Main Shaft 53004 at left side and push Main Shaft out while turning hand wheel slowly. The Punch shall take up all parts up to and including the Excenter for the stitch position.

Remove Main Shaft entirely.

Take out old belt with upper pulley.

Put new belt on upper belt pulley and insert belt so that the bottom of the belt rests on lower belt pulley 53211.

Replace Main Shaft and take over all parts from Punch to Main Shaft.

When replacing needle bar crank 53045 on Main Shaft, do not bend needle bar crank.

Fasten needle bar crank 53045 with pointed screw bolt S345 so that it fits in the groove of the Main Shaft, and so that the Main Shaft has no play lengthwise, but is not tight. Fasten screws S 345 and S 970 tightly. There should be 0.004" play between the bushing for the release of the hand wheel and the bearing. The Excenter for the stitch regulation 52065 should be adjusted exactly to the marking. Adjust excenter laterally so that the stitch regulation fork 52061 has only slight play. Tighten bolt S 216 well.

Put needle bar into lowest position. Adjust zigzag excenter according to the marking.

Adjust conical gear 53096 so that the marked teeth fit together. (Watch for marking). Tighten bolt screws S 1362 well. Then release upper belt pulley, put needle bar into lowest position, 0.1" loop lift, tighten upper belt pulley.

Then loosen the two set screws S 1243 at the lower pulley. Loosen screws S 581 of the casing for the conical gear on the hook driving shaft and remove the casing. Loosen the set screws S 1362 of the conical gear 89673 and move the hook driving shaft so far to the left that the lower pulley can be removed. Take out old belt, put lower end of belt over lower pulley and move hook driving shaft to the right through the bar of the lower pulley.

Check for straight run of the belt and fasten all loosened assembly parts. Check adjustments and sew off.

Advise your customers to:

(1) Make full use of the Adlermatic Instruction Book which is an invaluable guide to better sewing.

(2) Clean and oil sewing machine periodically as directed in the Instruction Book.

(3) Clean the surfaces of the hook and to remove all thread and lint out of the hook assembly.

(4) Take out the stitch plate when cleaning and to remove all lint from feed dog.

(5) Hold upper and under thread when starting to sew.